

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

PART VI - B

WATERBODY MANAGEMENT PLAN SERIES

UNIVERSITY LAKES

**WATERBODY EVALUATION &
RECOMMENDATIONS**

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED EVERY FIVE YEARS

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Recreational fish species are managed to maintain sustainable populations while providing anglers the opportunity to catch or harvest numbers of fish.

Commercial

Commercial fishing is prohibited.

Species of Special Concern

None present

EXISTING HARVEST REGULATIONS

Governed by City ordinance (SEE [APPENDIX I - Parks and Recreation, Chapter 4, Sections 3:74](#))

Recreational

Statewide regulations are in effect for all game fish species:

<http://www.wlf.louisiana.gov/fishing/regulations>

Commercial

No person shall engage in commercial fishing or the buying or selling of fish caught in University Lake. The use of trotlines, nets, or other devices is prohibited by city ordinance.

Species of Special Concern

None

SPECIES EVALUATION

Recreational

Largemouth bass (*Micropterus salmoides*, *M. floridanus* and *M. salmoides x floridanus hybrids*) are targeted for evaluation since they are a species indicative of the overall fish population due to their high position in the food chain and because they are highly sought after by anglers. Electrofishing is the best indicator of largemouth bass abundance and size distribution, with the exception of large fish.

Largemouth Bass

Spring electrofishing indicates that there has been an overall decrease in catch-per-unit-of-effort (CPUE = bass per hour) of largemouth bass (*Micropterus salmoides*) since 1995 (Figure 1). The greatest decline is noticed between 1995 and 2007 samples. This is likely due to the massive fish kill that occurred in 2003. It was estimated that over 150,000 fish, primarily threadfin shad (*Dorosoma petenense*), perished due to a decaying algal bloom. In the 2010 spring samples, stock-sized fish catches have nearly rebounded to the 1995 levels. Spring electrofishing samples show that relative weights of largemouth bass have also declined from high values observed in 1995. However, body condition of largemouth bass has remained at a healthy level of 90 since 2006 (Figure 2).

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe length-frequency data. Proportional stock density compares the number of fish of quality-size (greater than 12 inches for largemouth bass) to the number of bass of stock-size (8 inches in length). The PSD is expressed as a percent. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. For example, Figure 3 below indicates a PSD of 40 for 2008. The number indicates that 40% of the bass stock (fish over 8 inches) in the sample was at least 12 inches or longer.

$$\text{PSD} = \frac{\text{Number of bass} > 12 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

Relative stock density (RSD) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches (preferred-size) or longer.

$$\text{RSD} = \frac{\text{Number of bass} > 15 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

Although there was an increase in the overall mean CPUE in 2010, the size-structure indices for largemouth bass decreased in both the proportion of quality-size and preferred-size fish (Figure 3).

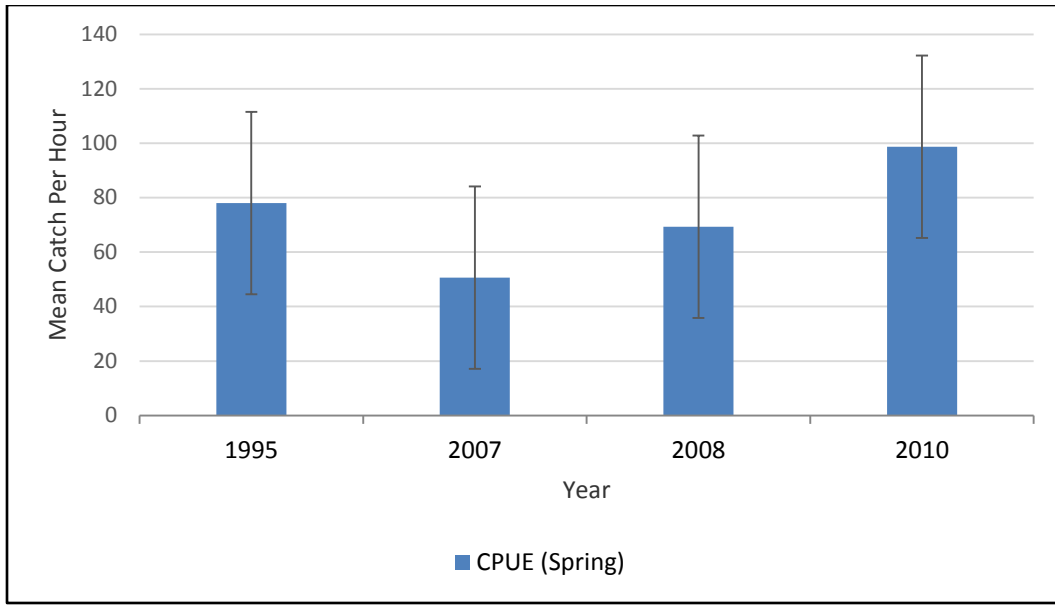


Figure 1. The mean CPUE (number per hour) for largemouth bass from University Lake, LA, in spring electrofishing results from 1995, 2007, 2008 and 2010. Error bars represent 95% confidence limits of the mean CPUE.

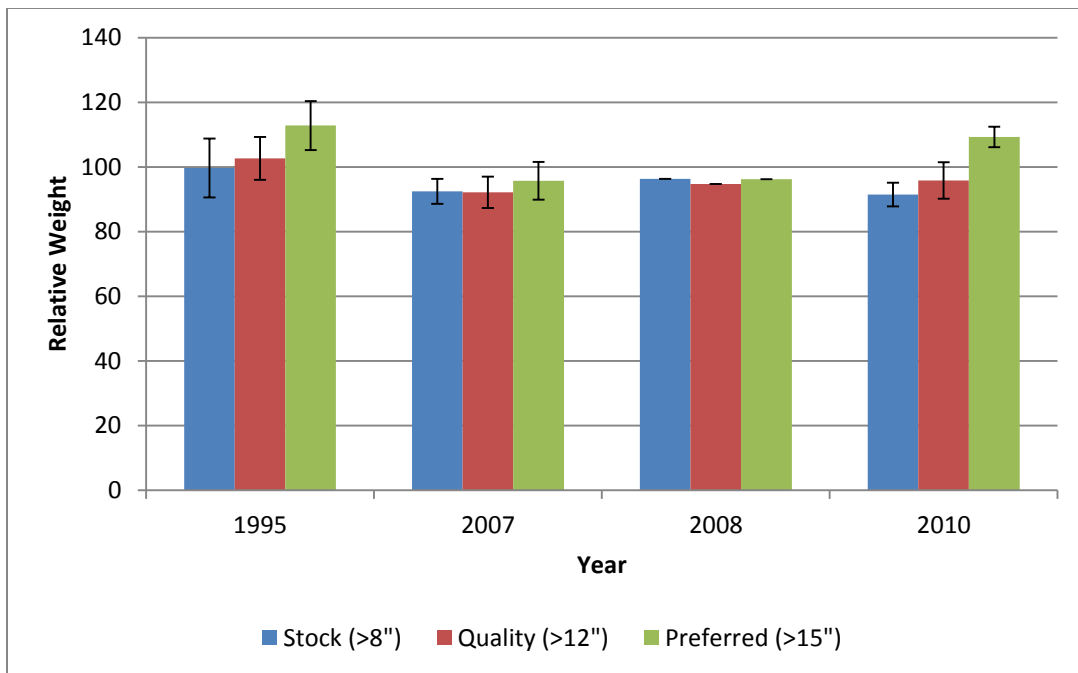


Figure 2. The mean W_r (\pm 95% CI) for largemouth bass collected in spring electrofishing samples from University Lake, LA, from 1995, 2007, 2008 and 2010. Error bars represent 95% confidence limits of the mean W_r 's.

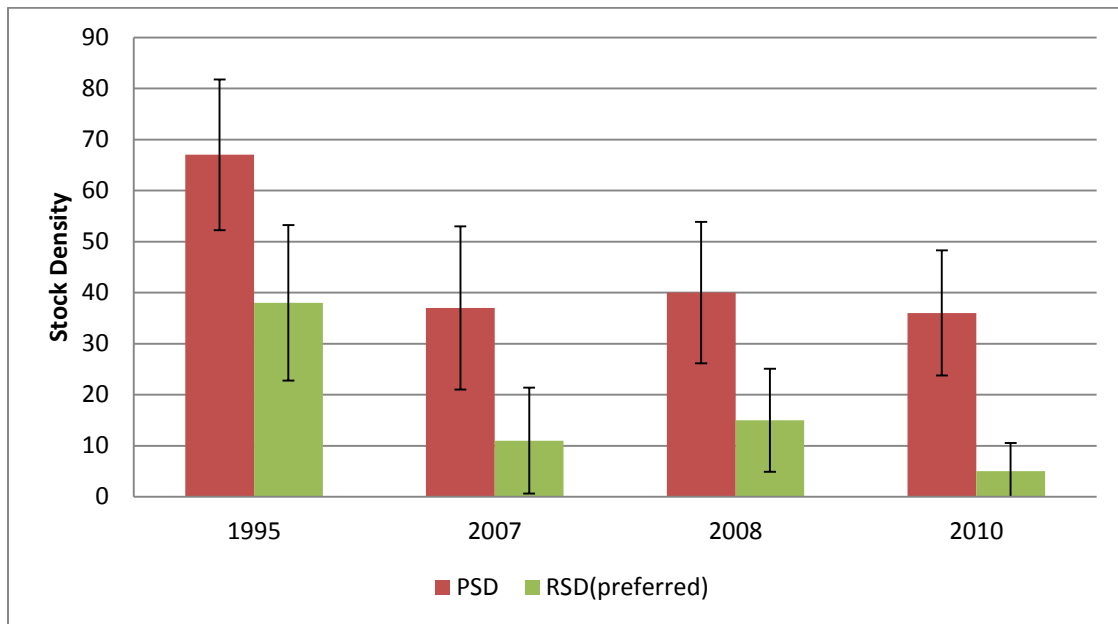


Figure 3. The mean size-structure indices (PSD and RSDp) for largemouth bass from University Lake, LA, for spring electrofishing results from 1995, 2007, 2008 and 2010. Error bars represent 95% confidence limits of the mean size-structure indices.

Genetics

Before 2013, only one largemouth bass had been tested for the Florida allele. In 1992, a trophy bass weighing 15.38 pounds was tested and the results were of a pure Florida strain. In 2013, 82.4% of largemouth bass tested carried the Florida allele (Table 1).

Table 1. Genetic analysis of largemouth bass from University Lake, LA 2013.

GENETICS					
Year	Number	Northern	Florida	Hybrid	Florida Influence
2013	34	17.6%	14.7%	67.7%	82.4%

Stockings

As shown in Table 1, University Lake has been stocked with 152,704 Florida largemouth bass since 1984.

Table 1. Florida largemouth bass stocking history on University Lake, LA from 1984 – 2011.

Florida LMB Stocking	
Year	Number of Fish
1984	32,400
1992	4,000
1993	5,002 (fingerlings)
1995	5,000 (fingerlings)
1996	15,186 (fingerlings)
2000	1,676 (fingerlings)
2004	761 (fingerlings)
2005	1,437 (fingerlings)
2007	2,996 (fingerlings)
2008	3,123 (fingerlings)
2010	1,260 (fingerlings)
2011	1,629 (fingerlings)

Crappie and Sunfish

Both black and white crappies (*Pomoxis nigromaculatus* and *P. annularis*), along with bluegill, redear, longear, green, orangespotted and warmouth sunfishes (*Lepomis macrochirus*, *L. microlophus*, *L. megalotis*, *L. cyanellus*, *L. humilis* and *L. gulosus*, respectively) are present in the lake. White crappies are more prevalent in the lake than black crappie. This is likely the result of the turbid conditions (secchi depths range 7”- 13”). Spring 2010 electrofishing samples indicated an abundance of stock-, quality-, and preferred-sized white crappies (Table 2), while no black crappies were observed during that season. Electrofishing will be employed to further analyze crappie populations on University Lake, as it is too shallow to effectively fish leadnets. Bluegills are the most abundant of the sunfishes that occur in University Lake, followed by longear and green sunfishes.

Table 2. White crappie CPUE by size structure indices from spring 2010 electrofishing samples on University Lake, LA.

2010 White Crappie Catch/Hour Spring Electrofishing			
Stock (>5”)	Quality (>8”)	Preferred (>10”)	Memorable (>12”)
10.7	10.7	8	2.7

Catfish

Catfish data from spring 2010 electrofishing showed that only channel catfish (*Ictalurus punctatus*) were collected. No blue or flathead catfishes were observed that season, although, flathead catfish were collected via nonstandard gear and anglers were observed harvesting blue catfish. Figure 4 below shows the CPUE's per inch group of channel catfish data collected and analyzed. The results indicate that the greatest abundance is within the 15 inch group whereas all others greater than 11 inches have the same value.

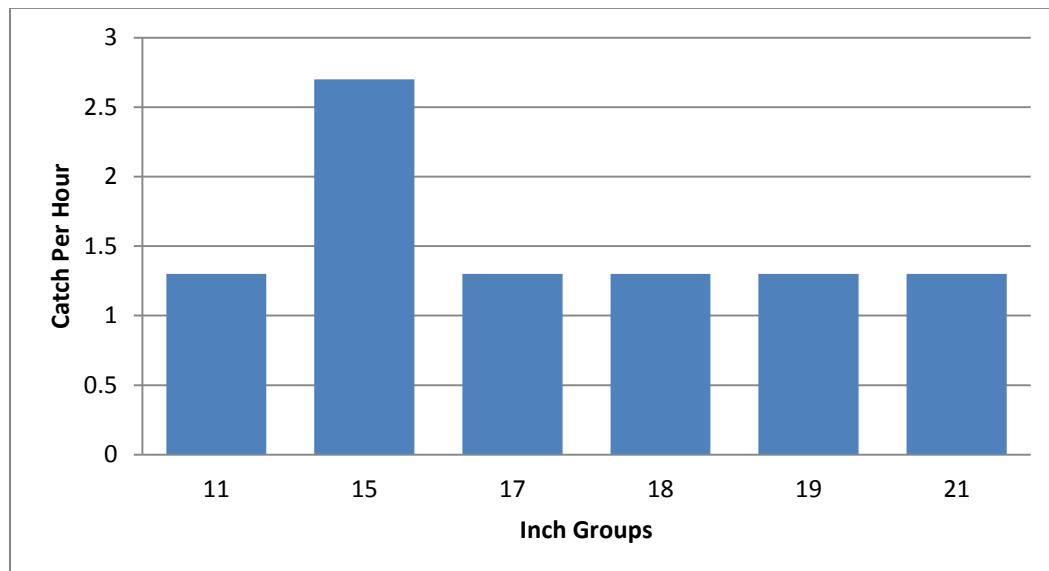


Figure 4. The Catch-per-unit-effort (CPUE) by inch group for channel catfish on University Lake, LA, in 2010.

Forage

Forage is comprised mainly of gizzard (*Dorosoma cepedianum*), threadfin shad (*Dorosoma petenense*), and bluegill. Forage estimates in pounds per hour derived from electrofishing samples are presented in Table 3.

Table 3. Forage CPUE estimates (pounds per hour) from a 2006 electrofishing site on University Lake, LA.

Forage Estimates from Electrofishing Data	
Year	Total pounds/hour
2006	15.17

Aquatic Invasive Species

Though their population has not been monitored, common carp (*Cyprinus carpio*) are commonly observed in the lake. It is highly suspected that their activities in soft sediment further exacerbate turbidity problems.

HABITAT EVALUATION

Aquatic Vegetation

Aquatic plants, especially submersed macrophytes play a minor role in University Lake. Historically there were sparse stands of coontail (*Ceratophyllum demersum*) in the lake's coves that have since disappeared due to siltation and turbidity issues. Currently, water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*) comprise less than five surface acres and require a foliar application at least twice a year. Approximately 90 percent of the shoreline is established with emergent vegetation, primarily wild taro (*Colocasia esculenta*).

Water Quality

University Lake is impacted from hyper-eutrophic conditions due to nutrient loading. Over the last 20 years, U.S. Army Corps of Engineers (USACE) studies have shown that large amounts of nutrient-laden non-point source runoff, particularly phosphorus, have contributed to the degradation of the lake. Link to USACE studies:

<http://www.mvn.usace.army.mil/pd/projectslist/ProjectData/108824/reports/University%20Lakes%20PRP.pdf>

The lake has become a sink with nutrients stored in a highly organic unconsolidated layer on the lake's bottom. The exchange of these nutrients with the water column has created hyper-eutrophic conditions that result in excessive summertime algal blooms. These conditions, along with shallow water and high temperatures, have led to a decrease in water quality, particularly unstable dissolved oxygen levels.

Substrate

Sedimentation, particularly in the fingers and coves, has reduced available spawning habitat. Flocculent materials have created a soft unconsolidated layer not suitable for centrarchid spawning. In 1981, a restoration project attempted to dredge the lake in an effort to deepen the water and remove the soft nutrient-laden sediment layer. The dredging efforts were thwarted due to the numerous underwater stumps that exist throughout the lake. Funding for the dredging project did not include the expense of stump removal. Therefore, suction dredging was not as successful as had been expected.

Artificial Structure

Currently there is a lack of complex cover found in University Lake. The deficiency is primarily due to the lack of submersed vegetation. A range of 15-30% areal coverage of complex cover is considered optimal for sportfish habitat. In 2010, University Lake supported no more than 10% total aquatic plant coverage, consisting of emergent and floating species. Complex cover is limited to cypress stumps, a few fallen trees, riprap, and piers. In an effort to increase future angler success rate, the addition of artificial complex cover will be considered.

CONDITION IMBALANCE / PROBLEM

1. Sedimentation and accretion have reduced lake water volume.
2. Shallow conditions throughout have decreased the lake's ability to buffer high nutrient loads and summertime heat.
3. Lack of complex cover.
4. Nutrient-laden runoff creates hyper-eutrophic conditions. Excessive algal blooms and resulting periods of low water quality result.
5. Common carp populations in need of control.

CORRECTIVE ACTION NEEDED

1. Dredge the lake to remove the nutrient-laden sediment layer and to increase the lake's water holding capacity.
2. Create vegetated buffer zones and revise drainage practices to reduce nutrient-laden runoff.
3. Control common carp.

RECOMMENDATIONS/ACTION PLAN

1. Continue stocking of Florida largemouth bass to provide fish of a greater than average size.
2. Continue standardized sampling of fish populations in 2017 to evaluate the condition of the stocks.
3. Install control measures to address siltation, bank erosion and nonpoint-source pollution from runoff.
4. Continue to work with USACE/BRAF to secure funds for a proposed restoration project to dredge the lake. This project would include the expense of stump removal and also include habitat renovations.
5. Re-establish desirable aquatic vegetation. This re-establishment is to begin shortly after USACE/BRAF proposed restoration project has been completed.
6. Nuisance aquatic vegetation - Water hyacinth and water lettuce tend to grow together in University Lake. For this reason, they should be controlled with a mixture of glyphosate (0.5 gal/acre), flumioxazin (4 oz/acre), and a non-ionic surfactant (1 pint/acre). American lotus should be controlled with glyphosate (0.5 gallons per acre) and a non-ionic surfactant (0.25 gallons per acre) or a mixture of glyphosate (0.5 gal/acre), flumioxazin (4 oz/acre), and a non-ionic surfactant (1 pint/acre) if the lotus is mixed with water hyacinth and water lettuce. Applications specifically targeting lotus should be conducted in early/mid spring as soon as the lotus plants have emerged above the water surface. This treatment should be conducted using a tank sprayer mounted in either a surface drive boat or airboat. If all areas cannot be accessed by boat for application, the use of a roadside sprayer will be employed to at least maintain a clear shoreline area. Applications will be repeated as necessary throughout the growing season in order to prevent the spread of American lotus within the lake.

APPENDIX I – Parks and Recreation, Chapter 4, Section 3:74

([return to recreation](#))

<http://library.municode.com/index.aspx?clientID=10107&stateID=18&statename=Louisiana>

Sec. 3:74. - Fishing regulations. (City)

(a)

Commercial fishing. No person shall engage in commercial fishing or the buying or selling of fish caught in either the City Park Lake or the New University Lake.

(b)

Rods, reels and poles permitted. No person shall fish in either of the lakes except with rods and reels and poles, and then under such regulations and in such areas as may be established from time to time by the superintendent of the recreation and park commission, or Louisiana State University as to New University Lake.

(c)

Use of trotlines, nets, other devices prohibited. No person shall place any trotlines or nets in either of the lakes.

(d)

Fishing on main campus prohibited. No person shall fish at any time along or on the banks of the New University Lake bordering the main campus of Louisiana State University.

(City Code 1951, Title 3, § 74; Ord. No. 7403, § 1, 1-11-84)